WHAT IS CLAIMED IS:

1. An amino acid composition having a general formula H_2N-CH(R)-C(O)-OH, wherein the R functionality comprises a fullerene species, and wherein said R functionality is hydrolysis-resistant under typical biological conditions.

2. The amino acid composition of Claim 1, wherein said amino acid composition is a buckyamino acid.

3. The amino acid composition of Claim 1, wherein said amino acid composition is 5.

4. The amino acid composition of Claim 1, wherein the fullerene species is selected from the group consisting of fullerenes, buckyballs, buckyonions, buckytubes, and combinations thereof.

5. The amino acid composition of Claim 1, wherein both the amine functionality and the carboxylic acid functionality are protected.

6. The amino acid composition of Claim 1, wherein one of either the amine functionality or the carboxylic acid functionality is protected.

7. The amino acid composition of Claim 6, wherein the amine functionality is protected with a protecting group selected from the group consisting of Boc, Fmoc, and combinations thereof.

8. The amino acid composition of Claim 1, wherein the fullerene species is endohedrally-doped.

9. The amino acid composition of Claim 8, wherein the fullerene species is endohedrally-doped with a species selected from the group consisting of radioactive species, non-radioactive species, metals, gases, spin ½ nuclei, and combinations thereof.

10. An amino acid residue comprising an amino acid of Claim 1.

11. The amino acid residue of Claim 10, further comprising at least one naturally occurring amino acid.

12. A synthetic polymer comprising an amino acid composition of Claim 1, wherein the synthetic polymer is selected from the group consisting of peptide chains, polypeptides, proteins, and combinations thereof.

13. The synthetic polymer of Claim 12, wherein the synthetic polymer is a protein comprising a biological function selected from the group consisting of enzymatic, antibody, oxygen transport, ion transport, and combinations thereof.

14. The synthetic polymer of Claim 12, wherein the fullerene species is structure-determining.

15. The synthetic polymer of Claim 14, wherein the fullerene species provides for reaction "pockets" within said polymer.

16. The synthetic polymer of Claim 14, wherein the fullerene species serves as a link between at least two amino acids.

17. A method comprising the steps of:

a) reacting compound **1** with a compound selected from the group consisting of **2**, **7**, **10**, and combinations thereof, to yield an imine intermediate; and

b) hydrogenating the imine intermediate with BH_3-THF to yield at least one product selected from the group consisting of **4**, **9**, **12**, and combinations thereof.

18. The method of Claim 17, further comprising a deprotection step that provides for an amino acid composition of Claim 1.

19. The method of Claim 18, wherein the amino acid composition is a buckyamino acid.

20. The method of Claim 18, wherein the amino acid composition comprises **5**.

21. The method of Claim 17, further comprising a step of forming amino acid residues that comprise an amino acid composition of Claim 1.

22. The method of Claim 17, wherein said amino acid residues further comprise naturally occurring amino acids.